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A FEW FURTHER NOTES ON MODERN EPIDEMICS : SMALL-POX.

By J. FOSTER PALMER.

CONSTANT as we ever find the types of disease to be, over however long a period they are traced, it is not conceivable that small-pox appeared in the world as a new formation at a comparatively recent period. It is far more likely to have been in existence than not at any unrecorded period whatever.

It is therefore by no means improbable that it was known in China, as has often been stated, 3,000 years ago (B.C. 1122). One of the earliest seats of civilisation, with a history extending back some 5,000 years, it is naturally to China we should look for the early records of the disease, if any exist. That there are no others need not surprise us, as at that period all the modern nations of Europe were in a state of barbarism.

In Asia, however, it has no doubt been recognised from a remote antiquity, and it was probably introduced from Asia into Europe—but when?

In A.D. 218 an epidemic took place in Ceylon which some have identified with small-pox, and in A.D. 287 and in A.D. 302 there were epidemics in Syria and other parts of the East, the records of which, by the frequent reference to blindness as a sequel, seem to point to the same disease.

In the sixth century it is described by Procopius and Gregory of Tours as occurring in Arabia, Egypt, etc. In the expedition against Mecca by the Abyssinians in A.D. 550 small-pox broke out among the invaders. In A.D. 610 an undoubted epidemic of small-pox occurred in Mecca, causing considerable

and the Irish lady has smelt sport and is going like a saddled comet. The colt is doing his best, but there is a nasty jump ahead of you, and in about twenty-five seconds you are in the middle of a brook and your host is in the middle of the next parish. You crawl out, the colt follows and you go sadly home. The varmint terrier is at the heels of the doctor. So you are alone and have time to think. You lead your horse home as best you can. You get there three hours before he turns up, and when he does, he falls to on his food as if he hadn't a care in the world. He has done his list, killed his fox, earned his daily wage, and kissed his wife, and now he is going to eat his supper!

(To be continued.)

mortality. This epidemic, as well as its successors, has been fully described by the Arabian physicians (Rhazes,* etc.).

According to the *Irish Annals* the disease attacked Ireland during the latter part of this. the seventh century,† and has continued to do so at longer or shorter intervals until the present day. This was the first recognised epidemic in the British Isles, and is spoken of in the *Annals* as the "great leprosy," or, in the Irish language, "Bolgagh". It appears to have been known in England in the following century, during the reign of Alfred, but not as an extensive epidemic.

From the sixth to the twelfth century the disease is but little heard of, except in Spain and in the *Irish Annals*, in which there are frequent references to it. In A.D. 1174 it seems to have attacked England, apparently for the first time, although it had been so prevalent on the other side of St. George's Channel. During the Crusades it spread throughout the whole of Europe, and by the thirteenth century had become only too well known in this country. During the next few centuries it continued to break out periodically, and, soon after the discovery of America, began to establish itself in the New Hemisphere as well. Here, of course, it made great havoc among the native races. This is always the case when a new disease is introduced among any community. There is no doubt that races, after long acquaintance with any disease, and the loss of millions of lives, acquire a certain degree of immunity by the elimination of the more susceptible individuals. In the absence of the disease these individuals will naturally accumulate. It is, therefore, quite conceivable that the preventive inoculations now common among civilised nations may thus increase the general susceptibility to small-pox among the unprotected. Indeed the mortality from small-pox among the unvaccinated appears to be greater now than the general

* Abuhekr Ibn-Zacharia Mohammed Rhazes was an Arabian physician who practised at Baghdad in the ninth and tenth centuries. His is the earliest distinct account of small-pox extant.

† *Annals of Clanmacnoise*. There was an epidemic in Ireland in A.D. 550 which is referred to as small-pox by one of the annalists, but it appears to have been a form of leprosy or perhaps some squamous disease of the skin.

small-pox mortality before inoculation or vaccination were introduced. The latter used to be roughly estimated at about 25 per cent. In modern epidemics the former sometimes approaches 50 per cent.

The disease may in former times have been much more generally prevalent than any records indicate. In any case, however, it was brought more prominently into notice here in the sixteenth century, when it attacked King Edward VI.

From this time forward it seems to have been very frequently prevalent throughout Europe, especially in Spain. At the close of the following century, the seventeenth, it attacked another of our monarchs, Queen Mary II., this time with a fatal result (A.D. 1694). Small-pox was by this time well established in the country, and had become, as Macaulay says, "the most terrible of all the ministers of death . . . always present, filling the churchyards with corpses, tormenting with constant fears all whom it had not yet stricken, leaving on those whose lives it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to the lover".

The disease had been very severe for some years past, and this year (1694) was one of the worst. The eighteenth century found it full of terrible vigour and activity, carrying off crowned heads, and accounting, generally, for about 7 per cent. of the deaths from all causes. This was the case in London. In many places the mortality was still greater. It would mean, at the *present* state of the population, upwards of 7,000 deaths from small-pox in London alone and some 30,000 cases each year; the average mortality being, at that time, about 25 per cent.

In the year A.D. 1700 small-pox raged in the North of Europe. In 1703 in America. In 1708 chiefly in Ireland. In 1711 in England. In 1713 in Constantinople. In 1715 generally throughout Europe. In 1717 in Scotland, England and Germany. In 1719 and 1720 in the South of France.*

* It has been calculated that about 60,000,000 human beings died of small-pox during the eighteenth century (*vide Facts about Small-pox and Vaccination*).

It was at this time, when the disease had acquired an intensity and scope hitherto unknown, when men's minds were exercised as to the possibility of finding some means of checking the spread of such a fearful scourge, that a discovery was made which seemed to hold out some prospect of alleviation.

For a long period of time small-pox had been very prevalent and fatal in Circassia, and a custom had arisen of artificially introducing the disease into the system in order to prevent a future attack. The origin of this custom is not known. It may have been a relic of an earlier civilisation, of a custom practised long ages ago on purely scientific grounds, and continued long after the reasons for it had been forgotten. It may have been the result of patient observation in more recent times, or it may have been a secret kept in the hands of a few who had refused to impart their knowledge to others, and claimed it as one of their feats of magic, acquiring power and influence thereby.

By some means this custom had found its way to Constantinople, for it was certainly practised there during the epidemic of 1713. A few years later the wife of the English Ambassador in that city, Lady Mary Wortley Montagu, daughter of the Duke of Kingston, heard of it through Dr. Maitland, the physician to the Embassy. She made many inquiries and observations, which resulted in her being convinced of its efficacy, and she carried her conviction so far as to test it on her own son. In 1722 she returned home to England, and there induced the family surgeon to repeat the experiment on her daughter.

In those days the tendency of the healing art was rather towards conservatism. The maxim that "prevention is better than cure" would not altogether, perhaps, commend itself to the majority of its professors. Sanitation, generally speaking, was not their strong point. And so novel, unprecedented and dangerous a method of prevention as this was naturally looked upon with suspicion. Certain theologians also denounced it as artificially inducing disease, as endeavouring to counteract a Divine visitation, and as imitating the action of the devil, who caused boils on the body of Job.

The apostle of inoculation, however, was an influential personage, and the King * was induced to allow the experiment to be made on six † condemned criminals. Five of these took the disease in a mild form. The sixth was already immune from a previous attack, a fact which he had very judiciously suppressed. One was inoculated in the Chinese manner. For the Chinese, *il va sans dire*, have had their own methods of inoculation for some two thousand years or more. This consisted in soaking a pledget of wool, or some porous substance, in the matter from a ripe pustule, and introducing it into the nostrils. This, however, seems to be a modification of the usual Chinese method, which was to insert the skins of dried pustules into the nostrils on wool. They were kept in bottles for use when required. ‡

The custom of inoculation, however, spread slowly, although these experiments convinced many. In the first eight years after its introduction into this country only 845 persons were inoculated. Still, the belief in it continued to grow, and it soon became more prevalent, especially after the West Indian planters had tested the experiment on a larger scale upon their slaves. In 1742, only twenty years after its introduction, Dr. Mead, one of the best known physicians in England, wrote a work on small-pox and measles, in which he advocated inoculation. It was not till 1754 that the Royal College of Physicians pronounced in its favour. It was probably between these two last dates that Pope referred to small pox in his essay on the characters of women as still one of the unabated terrors of life, against which there was no resource except in a firm attitude of mental superiority:—

Spleen, vapours or small-pox, above them all,
And mistress of herself though china fall.

For the remainder of the eighteenth century its history is that of natural small-pox *plus* inoculated small-pox. The *minus* sign can refer to the deaths only; if, indeed, upon the

* George I.

† Some writers say seven, others five.

‡ "In porcelain vessels stopped with wax," Trousseau's *Lectures on Clinical Medicine*.

whole, there was any appreciable diminution of these. It seems doubtful whether the practice of inoculation was sufficiently prevalent before the end of the century to make a sensible difference to the total mortality. That the aggregate of small-pox in the country was enormously increased there can be no doubt. All who would have taken the disease under the old conditions must have taken it now. It is hardly conceivable that any of these can have escaped ; while, on the other hand, large numbers who would otherwise have escaped took the disease by inoculation, and, in some cases, must have imparted it to others. Of its influence on the case mortality, however, there can be no doubt ; for whereas, before inoculation was introduced, the average mortality from small-pox was about 25 per cent., the percentage was now reduced to a fraction, while in the inoculated cases themselves the mortality seems to have been less than one in a thousand. Altogether, the deaths from small-pox were reduced from one in four to one in several hundreds.*

It is not at first sight altogether obvious why small-pox which has been artificially and intentionally introduced into the system should be less severe and less fatal than when taken accidentally and unwillingly. It is not always on account of milder cases being chosen from which to convey the disease, for, when taken in the natural way, a mild case may give rise to a severe one. Trousseau suggests that the attack is milder because the system is unprepared for it. This sounds paradoxical, but is not really so. Epidemics, as a rule, attack by preference those whose vitality is lowered ; those who, in other words, are most susceptible. Pathogenic microbes, in fact, like

* Hooper (*Physician's Vade Mecum*) gives as the average of 25 years at the Small-pox Hospital prior to the introduction of vaccination 32 per cent. ; different epidemics varying from 15 to 42. The mortality statistics of certain towns in Yorkshire from 1720 to 1730 give 18. *The Gold-headed Cane* (this, of course, is not a first-hand authority) gives 25. Hooper gives exactly the same for the unprotected. For the mortality in inoculated cases Hutchinson (*Medical Times and Gazette*, vol. ii., p. 643) gives 1 in 500. Of 5,964 inoculated in the three years 1797-98-99, only three died. Probably the method of operating was now at its best, just before the introduction of vaccination.

other organisms, raise the largest crops where the soil has been best prepared for their reception. And even small-pox, although few seem to be exempt from its influence, does not attack all its victims at once, but finds some in a more receptive condition than others. By inoculation small-pox is introduced into the system before the resisting power has become enfeebled. It is forcibly introduced when the patient is still strong enough to offer some effective opposition to its unlimited development. Assuming, for the moment, the microbe to be a sentient being, we may consider that his object is to establish himself on tissue adapted to his complete evolution; that the ultimate aim of his ambition is the production of confluent small-pox in its severest form, and, presumably, also, the death of the patient by its means. On the other hand, an inoculated case is one which our microbe had not yet attacked, and had not intended to attack until he had observed certain weak points in the line of defence. When, however, the microbe has been introduced into the patient's system by human agency, he has to do the best he can with the material at his disposal, and thus the case is necessarily less severe than if the disease had been introduced later on in the natural way.

It is probable, too, that by inoculation of the disease through the skin the patient may escape in the early stage the morbid effects produced on the lungs or alimentary canal during the entrance of the pathogenic organism by the mucous membrane. If the respiratory or digestive organs are interfered with in the early part of the disease, the disturbance of nutrition thus caused would be another point making for the success of the microbe and against the recovery of the patient.

It is also conceivable (assuming small-pox, as before, to be a microbic disease) that the introduction of an appreciable number of microbes directly into the circulation at one time may be more conducive to the formation of antitoxins than when they are introduced gradually and by a more circuitous route. In other words, that a succession of microbes entering the system singly, or in small detachments, one after another, and, as it were, preparing the way for one another, may be more potent in their effect than when introduced in bulk, and

without selection, but in company with other microbes which may be more or less destructive of them.

Whatever may be the true explanation of the fact, the case-mortality of small-pox was enormously reduced by the introduction of inoculation. Its effect on the actual number of fatal small-pox cases it is impossible to determine, for the disease continued to rage throughout the eighteenth century, long after it had become a recognised method of prevention. Indeed, it has been supposed, and is highly probable, that many centres of infection arose from this cause. In 1726, in 1731, in 1745, in 1752, in 1756 and 1757 it was especially severe. In 1759 Copenhagen was devastated by it. In 1767 a hundred thousand people are said to have died of it in China. In 1769 it was very prevalent in the United States; in 1772, 1775 and 1784 in Europe, and in 1799 in North Africa.

Had the practice of inoculation continued, it is not unlikely that by improvements in the methods of operating, by selecting the milder and distinct cases, and by transmitting the disease through several series of human beings, the resulting disease might have become so far modified as to render the operation simple and practically safe, and attended by little more than a passing inconvenience. Towards the close of the century it was becoming very successful in its results. The fact appears to have been recognised that it had given rise to centres of infection, and home hospitals began to spring up for the reception of cases. These homes, although advertised with very defective taste, were, no doubt, right in principle, but the time allowed for becoming free from infection seems to have been unwarrantably short.* At this very period, however, another

* A writer in a recent number of *Notes and Queries* (13th August, 1904) quotes the following advertisement from a newspaper of 1790. Whether the advertiser is a medical man does not appear: "Inoculation by Robert Goodman, of Guilsborough, at a Lodge, in the Parish of Guilsborough, at Two Guineas each patient, for a fortnight, with all necessaries (wine excepted).

"All that please to put themselves under my care,
May depend on good usage and good proper Fare;
For twenty odd years this my Business I've made,
And am thought, by much People, to well know my Trade;
Then be not in Doubt, but with Speed to me come—
By the Blessing of God, I can send you safe Home."

system was being worked out which was destined to throw discredit upon inoculation, and ultimately to cause it to become a criminal offence.*

* The writer in *Notes and Queries* just referred to also gives an illustration of the feeling in the latter half of the eighteenth century with regard to inoculation. This is a tablet on the south wall of the chancel of St. Andrew's Church, Buxton, Norfolk, to a child named Mary Ann Kent. She is there said to be the "daughter of Mr. and Mrs. Kent, of Fulham, Middlesex, who died under Inoculation on the 16 day of March, 1773, in the fourth year of her age. This much lamented child was in the highest state of Health and her mental powers began to open and promise fairest Fruit, when her fond parents, deluded by a Prevalent Custom, suffered the rough officious hand of Art to Wound the Flourishing root of Nature, and rob the little innocent of the gracious Gift of Life. Let this unhappy event teach distrustful Mortals that there is no safety but in the hands of Almighty God." So that inoculation appears to have been opposed to the last by some. And, even now, after the lapse of a hundred years, and in view of all the new light they have given us, it is impossible to say with any degree of confidence whether, in their day, and with their lights, those opponents were right or wrong. Given the knowledge we now possess, they were, in a certain sense, right. Without it, were they wrong? Who shall tell?

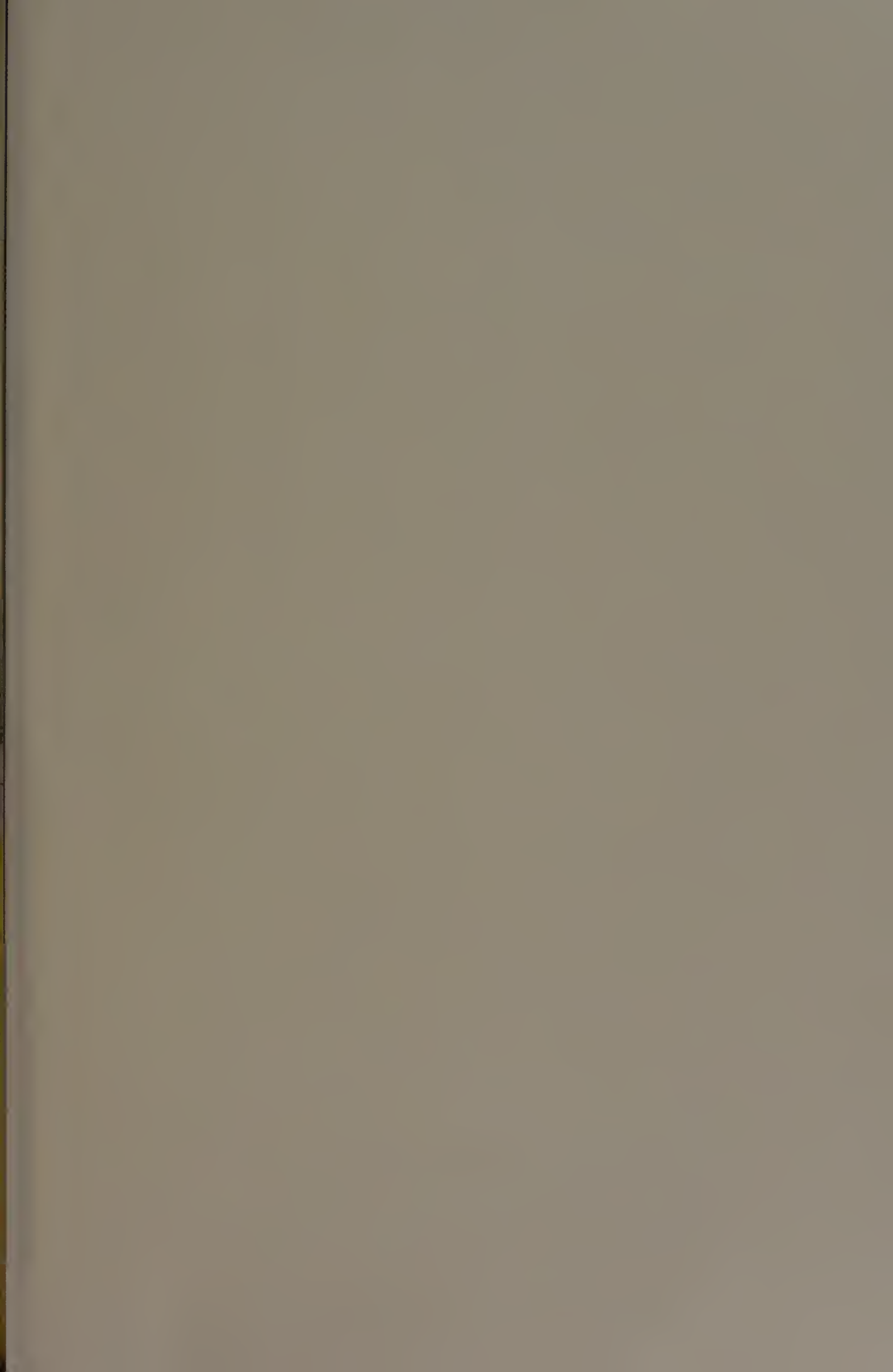
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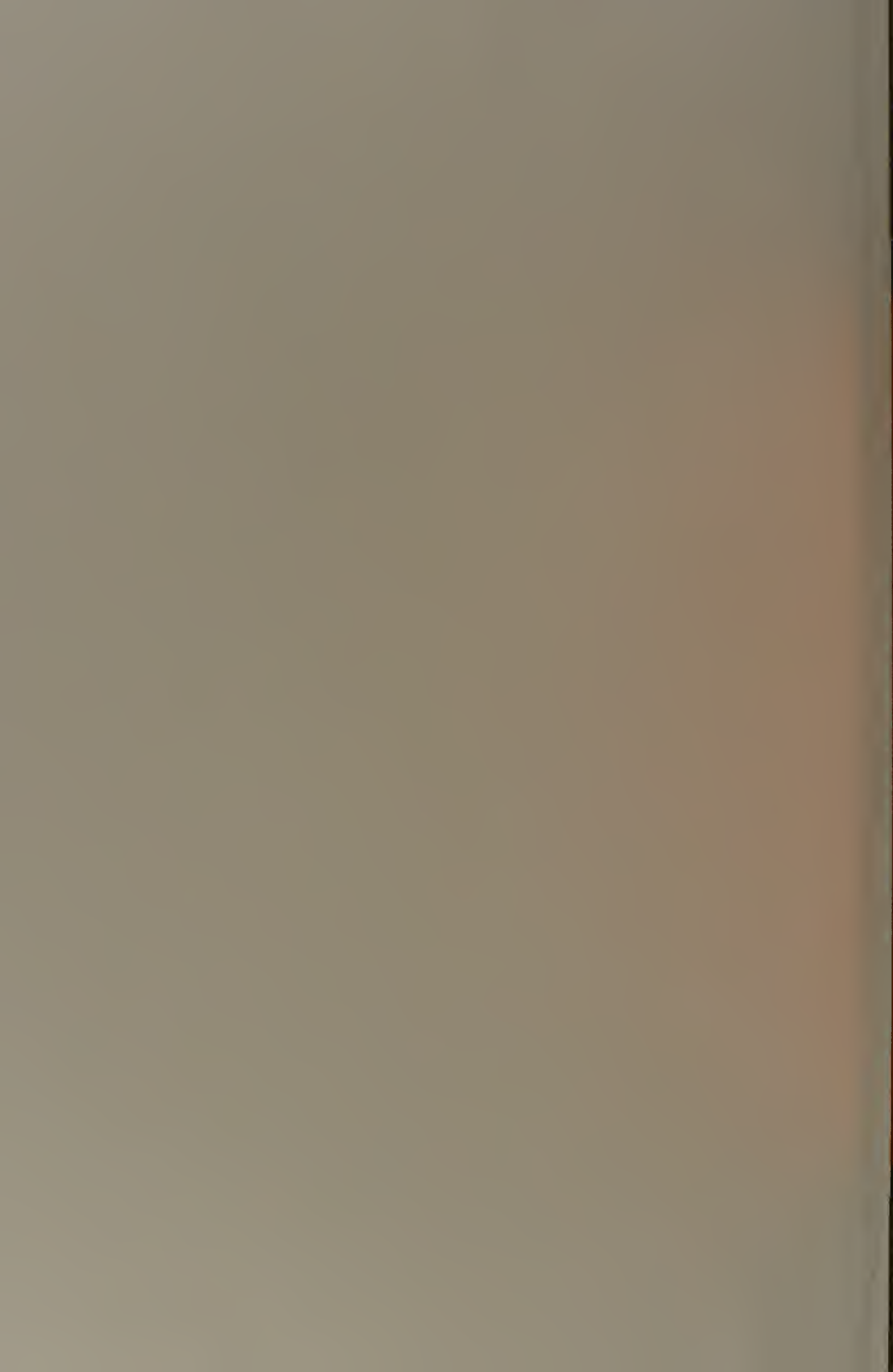
H. W. A.

PAIN, hydra-headed, his to slay
 Clamorous ever: day, by day
 That sure swift hand the monster slew
 Of human agony anew:
 With touch unfaltering, life re-gave
 Even from the edge of the near grave.
 How many hearts to hope leapt back!
 Doomed lives, from sorrow's bitter track
 Returning, blessing, ever keep
 His name in gratitude too deep
 For spoken word, . . . and, now, to-day
 Pay tribute far too fresh to say!

Rest quiet, son of skill! No word
 Save the low note of woe be heard;
 And should men seek thine epitaph
 There lies it in the lives thou hath—
 To men given back!

EDITH C. M. DART.





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